REMARKS

A Non-Final Office Action dated November 1, 2002 has been given careful consideration by the applicants. Claims 1-35 remain in the application. Reconsideration of the application is hereby respectfully requested.

The Office Action:

The Examiner objected to the specification.

The Examiner objected to claims 6, 14 and 26 under 35 U.S.C. §112, second paragraph.

Claims 17, 21, 30, 34 and 35 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 5,920,808 to Jones et al.

Claims 1-3, 8-12, 15, 16, 18, 19, 22-24, 27-29, 31 and 32 were rejected under 35 U.S.C. §103 as being unpatentable over Jones in view of U.S. Patent No. 5,963,549 to Perkins et al.

Claims 4, 5, 7, 13, 20, 25 and 33 were rejected under 35 U.S.C. §103 as being unpatentable over Jones in view of Perkins and further in view of U.S. Patent No. 6,288,610 to Miyashita.

Cited Patents:

Jones relates to a method and apparatus for reducing key-up distortion by preheating transistors. Jones does not specifically disclose obtaining predistortion parameters based on in-phase and quadrature components, as in the present invention, nor does it disclose an index calculating module operative to calculate index values based on these components of the baseband signal, a look-up table, or an output module operative as claimed.

Perkins relates to a fixed wireless loop system having baseband combiner predistortion summing tables. Perkins is cited for its purported teaching of clipping signals by summing I and Q components and subsequently using look-up tables.

Miyashita relates to a method and apparatus for correcting signals, an apparatus for compensating for distortion, an apparatus for preparing distortion compensating data and a transmitter. Miyashita is cited for its purported teaching of predistortion characteristics defined by polynomial equations.

The Claims are Patentably Distinct over the Cited Patents:

The Examiner rejected claims 7, 21, 30, 34 and 35 as being anticipated by Jones. However, as detailed below, Jones does not anticipate these claims, some of which have been amended.

More specifically, Jones does not disclose calculating or obtaining predistortion parameters and outputting a signal base thereon, as in the present invention. Specifically, Jones does not disclose obtaining these predistortion parameters based on the in-phase and quadrature components of the baseband signal. Still further, Jones does not disclose calculating an index value based on those components and retrieving values based thereon. Because each of the amended independent claims 7, 21 and 30 recite one or more of these features, these claims, and all claims dependent thereon (e.g. 34 and 35), are not anticipated by Jones.

Claims 1-3, 8-12, 15, 16, 18, 19, 22-24, 27-29, 31 and 32 were rejected as being obvious over Jones in view of Perkins. However, as will be detailed below, these claims are not rendered obvious by this combination.

First, there is no motivation to combine the teachings of Jones and Perkins. As noted above, Jones relates to a method and apparatus for reducing key-up distortion by

preheating a transistor. In the disclosure, Jones addresses the key-up period and its implementation of preheating. It also identifies a predistortion portion of the circuit. It is significant to note, however, that Jones does not mandate that any particular predistortion scheme be used. It indicates that any suitable predistortion scheme would suffice. In any event, the predistorter 107 of Jones operates to, among other things, scale signals up and down, as shown in Figure 8, prior to the signal being provided to a digital-to-analog converter.

Perkins illustrates a process to clip a signal prior to being provided to a digital-to-analog converter by using a look-up table and the magnitude of the in-phase and quadrature components of the original baseband signal. Perkins does not show predistortion feedback, as is shown in Jones.

Accordingly, the combination suggested by the Examiner has no motivation or suggestion in the cited patents. That is, Jones teaches a way of attenuating a signal prior to being input to the digital-to-analog converter. Jones would thus have no need for a "clipping" to be accomplished on the signal by way of look-up table, as indicated in Perkins.

These patents are not combinable for an additional reason. Specifically, Perkins does not disclose a feedback path for purposes of predistorting the baseband signal. Therefore, the teachings diverge on this point and would not be combinable.

Second, even if the teachings of these patents were combinable, the resultant combination would not render the claims obvious. That is, the resultant combination would be a system that provides predistortion by some unspecified means and would include a clipping portion that clips signals based on summing in-phase and quadrature components and subsequently using look-up tables. This, of course, does not render the present claims obvious.

By way of example, independent claim 1 includes an index calculating module operative to calculate index values based on the in-phase component and quadrature component of the baseband signal, a table look-up having stored therein parameters -- the parameters being retrievable based on the index values, and an output module operative to generate an output signal based on the parameters retrieved from the look-up table and an upsampled signal. These features are not fairly disclosed by the suggested combination.

Likewise, claim 9 recites a step of obtaining predistortion parameters by calculating an index value based on in-phase and quadrature components of the baseband signal and retrieving parameter values based thereon. These features are not rendered obvious by the suggested combination.

In addition, independent claims 16 and 27 recite means-plus-function language. As mandated by statute (i.e. 35 U.S.C. §112, sixth paragraph), the details of the specification must be referenced to interpret these claims. It is clear that the means for calculating, means for retrieving, and means for outputting of the present invention do not correspond to the teachings of the suggested combination. At the very least, the suggested combination does not provide components to calculate index values based on the in-phase and quadrature components and retrieve parameter values based thereon such that predistortion is accomplished, as in the present invention.

Accordingly, the claims are not rendered obvious by the suggested combination of Jones in view of Perkins.

Claims 4, 5, 7, 13, 20, 25 and 33 were rejected under the Jones and Perkins combination in further view of Miyashita. The Examiner, however, does not establish that these patents are combinable and points to no portions of Miyashita that cure the specific deficiencies of the combination noted above. Therefore, the Examiner's rejection should be reconsidered.

Non-Art Objections and Rejections:

The Examiner objected to the specification for its citation to a co-pending application for which no serial number was available at the time of filing. The serial number (and now issued patent number) are available and have been inserted. Therefore, the objection has been addressed

The Examiner also rejected claims 6, 14 and 26 under 35 U.S.C. §112, second paragraph. Specifically, the Examiner indicated that the variables noted in the claims require further explanation. However, it is submitted that these variables, as defined in the claims, and read in view of the specification, are clear to those of skill in the art. Therefore, it is submitted that no further clarification is required and requested that the Examiner reconsider his position. The objection should be removed.

CONCLUSION

In view of the foregoing amendments and comments, favorable action is respectfully requested.

Respectfully submitted,

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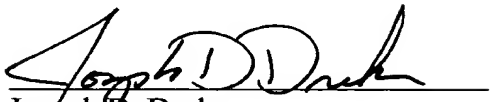

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Attachment: Version with Markings to Show Changes Made

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Version with Markings to Show Changes Made

In the Specification:

The paragraph beginning on page 1, line 4, has been amended as follows:

This application is related to U.S. Application Serial No.09/396,829 entitled "Dynamic Path Gain Compensation for Radios in Wireless Communication Systems" filed on even date herewith on behalf of Miguel Dajer, Edward Ellis Eibling and Mark Y. McKinnon (Attorney Docket No. 07007/14; Applicant Case Name and No. Dajer 7-6-2), now U.S. Pat. No. 6,507,732 (issued January 14, 2003), which is hereby incorporated herein by this reference.--

In the Claims:

Please amend claims 9, 11, 17, 21, 23 and 30 as follows:

9. A method for adaptively predistorting a base-band signal having an in-phase component and a quadrature component, the method comprising:

generating the base-band signal by a communication device;

clipping the base-band signal to produce a clipped signal;

filtering the clipped signal to eliminate high frequency components of the clipped signal to produce a filtered signal;

increasing the sampling rate of the filter signal to obtain an upsampled signal;

obtaining predistortion parameters by calculating an index value based on in-phase and quadrature components of the baseband signal and retrieving parameter values based thereon;

outputting an output signal based on the predistortion parameters and the upsampled signal;

sampling RF signals generated based on the output signals; and,

providing adaptive feedback based on the sampling.

11. The method as set forth in claim 9 wherein the obtaining of the parameters includes calculating [an] the index value by summing squares of the in-phase component and the quadrature component.

17. An apparatus for adaptively predistorting a base-band signal, the apparatus comprising:

a sampling module to increase the sampling rate of the signal to obtain an upsampled signal;

a module operative to calculate predistortion parameters by calculating an index value based on in-phase and quadrature components of the baseband signal and retrieving parameter values based thereon;

an output module operative to generate an output signal based on the predistortion parameters and the upsampled signal;

a receiver operative to retrieve samples of RF signals generated based on the output signals; and,

a processor operative to provide adaptive feedback based on the samples.

21. A method for adaptively predistorting a base-band signal having an in-phase component and a quadrature component, the method comprising:

obtaining predistortion parameters based on the in-phase component and the quadrature component by calculating an index value based on in-phase and quadrature components of the baseband signal and retrieving parameter values based thereon;

outputting an output signal based on the predistortion parameters;

sampling RF signals generated based on the output signal; and,

providing adaptive feedback based on the sampling.

23. The method as set forth in claim 21 wherein the obtaining of the parameters includes calculating [an] the index value by summing squares of the in-phase component and the quadrature component.

30. An apparatus for adaptively predistorting a base-band signal, the apparatus comprising:

a module operative to calculate predistortion parameters by calculating an index value based on in-phase and quadrature components of the baseband signal and retrieving parameter values based thereon; and,

an output module operative to generate an output signal based on the predistortion parameters and an upsampled base-band signal.